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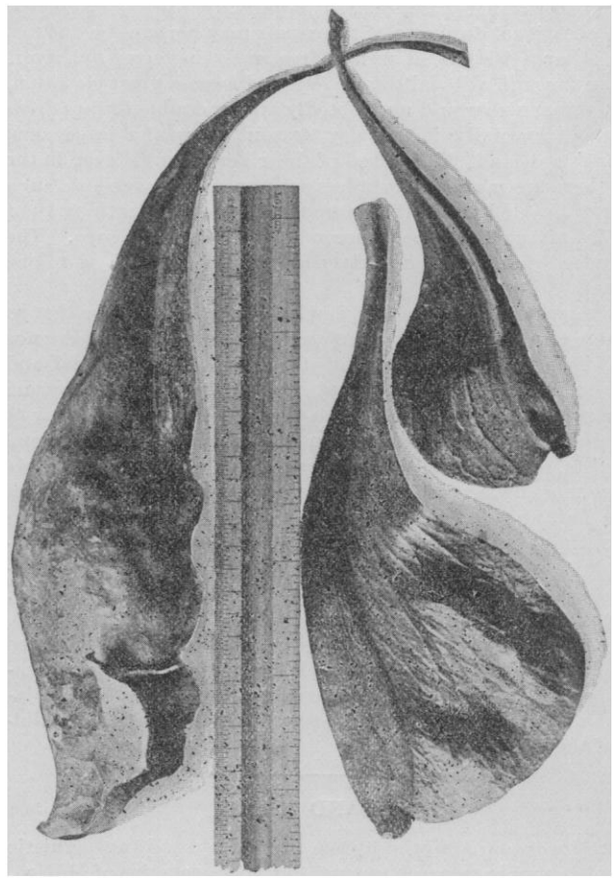
Attention is called to the "Wants" column. It is invaluable to those who use it in soliciting information or seeking new positions. The name and address of applicants should be given in full, so that answers will go direct to them. The "Exchange" column is likewise open.

## THE PRODUCT OF A CHANGED ENVIRONMENT.

BY GEORGE H. HUDSON, STATE NORMAL AND TRAINING SCHOOL, PLATTSBURGH, N. Y.

TOWARD the latter part of September or early in October 1891, a number of pitcher plants (*Sarracenia purpurea*, L ) were sent to me from Wolf Pond, Franklin Co., N. Y., together with other bog plants, for our school Wardian case. This case is 120 cm. long, 51 cm. wide, 45 cm. deep, and stands before an east window where it does not get very much light, save on sunny mornings. We keep in this case many kinds of mosses, ferns, some fungi, and several small animals such as salamanders, toads, wood-frogs, young alligators, and different insect larvæ. This case also furnishes abundant material for microscopic study, such as rhizopods, infusorians, rotifers, etc. The pitcher plants were carefully set out in the east side of the case, and for several months the pitchers were kept filled with water, and were occasionally fed with flies and bits of meat. Later in the season the plants were neglected; the pitchers were not filled with water, nor was any kind of animal food given them. In the late spring there were two plants living. These plants had begun to increase the width of the leaf-like margin of their pitchers while the hoods and tubes themselves were suffering a marked change. These changes were intensified during the summer, and the result is shown by the reproduction of a photograph taken Nov. 5, 1892. This photograph shows an old and somewhat decayed phyllodium from one of the two plants, and, in contrast with it, one of the new phyllodia from each. These new phyllodia are bright green, without a trace of the usual coloring, serving to attract insects, save on the very edge of the aborted and flattened hood, where a faint border about 2 mm. deep may be noticed. Some of these hoods have not opened; the hairs which line others are in an immature and useless condition. The leaf-like margins of these curiously modified petioles, instead of being from one-fourth to one-third the width of the tube as in normal specimens, have become from three to four times the width of the now weak and flattened tube. The scale photographed with these phyllodia will show the extent of this modification. The scale shows inches on the left and centimetres on the right. Of the next older phyllodia the larger hoods have decayed, while the tube and its wing-like expansion are still in a healthy condition. This pitcher plant grows wild in Plattsburgh, and I have seen it in many places in the Adirondack region, but I have never noticed such wide margins in a state of nature. Was the change in our Wardian case made because of the absence of animal food, which made it necessary for the plant to look in other directions for its support? Was it made because of the absence of the influence of water in its tubes while it was forming these new phyllodia? Was the plant obliged to sacrifice its pitchers in order to extend its chlorophyl-bearing surface on account of the loss of light? The changes made, it will be noticed, were just those changes which would best bring it into harmony with its changed environment. Was this change made in response to the demands of the new environment, or were the changes but the reversion to an ancient type consequent simply on the diminished vitality of the plant? This curious change suggests many experiments which might easily be made to determine the extent to which certain lower organisms could vary in response to external stimuli, and thus be able to adapt themselves to unusual conditions in a changed or changing environment.

Early in the winter one of the little toads used to get into a large prostrate phyllodium, apparently to take a bath. We have noticed him a number of times sitting just within the hood with



his body partly in the water. The red, spotted salamanders crawl over the alligator and share the sunny portions of the case with him. Believing these bright-colored beings not fit for food, he has offered the little things no violence. One of the small garden toads did not fare so well but became a victim of a pair of jaws that broke his bones in their embrace.

## LETTERS TO THE EDITOR.

**** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

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*The editor will be glad to publish any queries consonant with the character of the journal.*

### Variation in Native Ferns.

THE wide variation in the forms of British ferns is well known to all who read the works of English florists, but there is less of this in America. Scolopendrium vulgare will have different auricles at the base, and sometimes is forked at the apex, but it varies little beyond this. I have found Woodsia ilvensis also with a forked apex, but this rare.

Aspidium acrostichoides is much more variable in many ways. Almost any woodland will present differing forms, as regards